Anatomy of the Respiratory System

Upper and Lower Respiratory System Structures

1. Complete the labeling of the diagram of the upper respiratory structures (sagittal section).

2. What is the significance of the fact that the human trachea is reinforced with cartilage rings?
   
   C-RINGS HELP TO KEEP TRACHEA OPEN DURING INSPIRATION

   Of the fact that the rings are incomplete posteriorly?  
   TRACHEA IS STRUCTURALLY SUPPORTED BUT ALSO FLEXIBLE DUE TO INCOMPLETE RINGS  
   ESOPHAGUS CAN EXPAND AS LARGE FOOD ITEMS ARE SWALLOWED
3. Name the specific cartilages in the larynx that are described below:
   1. forms the Adam's apple **THYROID CARTILAGE**  3. broader anteriorly **THYROID CARTILAGE**
   2. a "lid" for the larynx **EPIGLOTTIS**

4. Trace a molecule of oxygen from the nostrils (nares) to the pulmonary capillaries of the lungs:
   Nostrils → NASAL CONCHAE → NASOPHARYNX → OROPHARYNX → LARYNGOPHARYNX → GLOTTIS → LARYNX → VOCAL CORDS → TRACHEA → MAIN BRONCHI → BRONCHIOLES → RESPIRATORY BRONCHIOLES → ALVEOLAR ducts → ALVEOLAR SACs → ALVEOLI → pulmonary capillaries

5. What is the function of the pleural membranes? **They provide a mechanism to allow the lungs to remain inflated by sticking to each other by hydrogen bonding & allow for sliding movements as the lungs (lubrication) change size during breathing**

6. Name two functions of the nasal cavity mucosa:
   - Clean & moisten the air
   - Warm & humidify air

7. The following questions refer to the main, or primary, bronchi:
   Which is longer? **LEFT**
   Larger in diameter? **RIGHT**
   More horizontal? **LEFT**

   The more common site for lodging of a foreign object that has entered the respiratory passageways? **RIGHT MAIN BRONCHUS**

8. Correctly label all structures provided with leader lines on the diagrams below.
9. Match the terms in column B to the descriptions in column A.

**Column A**

1. pleural layer covering the lung tissue
2. “floor” of the nasal cavity
3. food and fluid passageway inferior to the laryngopharynx
4. flaps over the glottis during swallowing of food
5. contains the vocal cords
6. the part of the conducting pathway between the larynx and the primary bronchi
7. pleural layer lining the walls of the thorax
8. site from which oxygen enters the pulmonary blood
9. opening between the vocal folds
10. increases air turbulence in the nasal cavity

**Column B**

alveolus
bronchiole
concha
epiglottis
esophagus
glottis
larynx
palate
parietal pleura
primary bronchi
trachea
visceral pleura

10. **Define external respiration:** **CONDUCTING AIR TO THE LUNG TISSUE & TAKING UP O₂ INTO THE BLOOD & REMOVING CO₂ FROM THE BLOOD.**
    **Internal respiration:** **DELIVERY OF O₂ TO THE TISSUE CELLS OF THE BODY & REMOVAL OF CO₂ FROM THE BLOOD IN THE CAPILLARIES.**

**Demonstrating Lung Inflation in a Sheep Pluck**

11. Does the lung inflate part by part or as a whole, like a balloon?

What happened when the pressure was released?

What type of tissue ensures this phenomenon?

**Examining Prepared Slides of Lung and Tracheal Tissue**

12. The tracheal epithelium is ciliated and has goblet cells. What is the function of each of these modifications?
   - **Cilia:** **TO MOVE DEBRIS-LADEN MUCUS UP & OUT OF THE BODY**
   - **Goblet Cells:** **TO PRODUCE THE MUCUS NEEDED TO HELP CLEAN THE AIR**

13. The tracheal epithelium is said to be “pseudostratified.” Why?
   **IT LOOKS LIKE IT HAS MULTIPLE CELL LAYERS, HOWEVER ALL THE CELLS ACTUALLY SPAN THE ENTIRE DIAMETER OF THE TISSUE, REACHING FROM BASEMENT MEMBRANE TO LUMEN.**

15. Why does oxygen move from the alveoli into the pulmonary capillary blood? **By simple diffusion due to a higher concentration of oxygen in the alveolar air versus that in the blood.**

16. What structural characteristic of the alveoli makes them an ideal site for the diffusion of gases? **Very thin membrane separating the air from the blood.**